IN THE INTERNATIONAL BUREAU (WIPO)

INTERNATIONAL APPLICATION NUMBER	INTERNATIONAL FILING DATE	INTERNATIONAL EARLIEST PRIORITY DATE
PCT/US03/11153	10 April 2003	11 April 2002

Title of Invention: **THERMALLY CONDUCTIVE COATING COMPOSITIONS, METHODS OF PRODUCTION AND USES THEREOF**

Applicant: **HONEYWELL INTERNATIONAL, INC.**

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LETTER FOR PCT ARTICLE 19
(PCT SECTION 205)

1. Applicant is submits replacement sheets numbered 24-28 to replace originally filed sheets numbered 24-28 for this application.

2. In respect of each claim appearing in the international application based on the replacement sheets submitted herewith, and in accordance with PCT Section 205, the following claim(s) is/are:

(i) unchanged: claim(s) **2-34 and 36-64**
(ii) cancelled: claim(s) **0**
(iii) new: claim(s) **0**
(iv) replacement of one or more claims as filed, as follows: **1 and 35**
(v) the result of the division of one or more claims as filed, as follows: **0**

Dear Sir:

The Search Report dated 10 December 2003 designated four references as being relevant to patentability. Claims 1 and 35 are herein amended to add the phrase "wherein each compound has a different solubility parameter", thus making the subject matter of the present application and the claims novel and non-obvious in view of the cited art. No new matter was added to the claims by virtue of these amendments, as they are fully supported by Original Specification page 8, lines 5-14.

Respectfully submitted,

Bingham McCutchen LLP

Dated: 2/10/04

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We claim:

1. (Presently Amended) A thermal interface composition, comprising:

at least two siloxane-based compounds, wherein each compound has a different solubility parameter,

at least one inorganic micro-filler material, and

at least one thermally conductive filler material.

2. (Previously Presented) The thermal interface composition of claim 1, wherein at least one of the siloxane-based compounds comprises a polysiloxane compound.

3. (Previously Presented) The thermal interface composition of claim 1, wherein at least one of the siloxane-based compounds comprises a hydride-functional siloxane compound.

4. (Previously Presented) The thermal interface composition of claim 2, wherein the polysiloxane compound comprises a substituted polysiloxane compound.

5. (Previously Presented) The thermal interface composition of claim 4, wherein the polysiloxane compound is substituted by a functional group comprising an alkyl group, an aromatic group, a halide group or a combination thereof.

6. (Previously Presented) The thermal interface composition of claim 4, wherein the substituted polysiloxane compound comprises an alkenyl-terminated polyalkylsiloxane.

7. (Previously Presented) The thermal interface composition of claim 6, wherein the alkenyl-terminated polyalkylsiloxane comprises a vinyl group.

8. (Previously Presented) The thermal interface composition of claim 7, wherein the alkenyl-terminated polyalkylsiloxane further comprises a methyl group.

9. (Previously Presented) The thermal interface composition of claim 5, wherein the polysiloxane compound comprises vinylmethylcyclotetrasiloxane, polytetradecylmethylsiloxane, polyoctylmethylsiloxane, decylmethylsiloxane, butylated aryloxy- propylmethylsiloxane, octadecylmethylsiloxane, dimethylsiloxane or a combination thereof.

10. (Previously Presented) The thermal interface composition of claim 3, wherein the hydride-functional siloxane comprises methylhydrosiloxane.

11. (Previously Presented) The thermal interface composition of claim 1, wherein the inorganic micro-filler material comprises silicon dioxide.

12. (Previously Presented) The thermal interface composition of claim 1, wherein the inorganic micro-filler material comprises a powder.

13. (Previously Presented) The thermal interface composition of claim 1, wherein the inorganic micro-filler material comprises a flake.

14. (Previously Presented) The thermal interface composition of claim 1, wherein the thermally conductive filler material comprises a transition metal.

15. (Previously Presented) The thermal interface composition of claim 1, wherein the thermally conductive filler material comprises boron.

16. (Previously Presented) The thermal interface composition of claim 14, wherein the transition metal comprises copper.

17. (Previously Presented) The thermal interface composition of claim 15, wherein the thermally conductive filler material comprises boron nitride.

18. (Previously Presented) The thermal interface material of claim 1, further comprising at least one additive.

19. (Previously Presented) The thermal interface material of claim 18, wherein the additive comprises a catalyst.

20. (Previously Presented) The thermal interface material of claim 18, wherein the additive comprises an inhibitor.

21. (Previously Presented) The thermal interface material of claim 18, wherein the additive comprises a rheological modifier.

22. (Previously Presented) The thermal interface composition of claim 19, wherein the catalyst comprises platinum.

23. (Previously Presented) The thermal interface composition of claim 20, wherein the inhibitor comprises an antioxidant.

24. (Previously Presented) The thermal interface composition of claim 21, wherein the rheological modifier comprises at least one solvent.

25. (Previously Presented) A coating composition comprising the thermal interface composition of claim 1.

26. (Previously Presented) A coating composition comprising the thermal interface composition of claim 18.

27. (Previously Presented) An electronic component comprising the thermal interface composition of claim 1.

28. (Previously Presented) An electronic component comprising the thermal interface composition of claim 18.

29. (Previously Presented) An electronic component comprising the coating solution of claim 25.

30. (Previously Presented) An electronic component comprising the coating solution of claim 26.

31. (Previously Presented) A semiconductor component comprising the thermal interface composition of claim 1.

32. (Previously Presented) A semiconductor component comprising the thermal interface composition of claim 18.

33. (Previously Presented) A semiconductor component comprising the coating solution of claim 25.

34. (Previously Presented) A semiconductor component comprising the coating solution of claim 26.

35. (Presently Amended) A method of forming a thermal interface material, comprising:

providing at least two siloxane-based compounds, wherein each compound has a different solubility parameter,

providing at least one inorganic micro-filler material,

providing at least one thermally conductive filler material, and

combining the at least two siloxane-based compounds, the at least one inorganic micro-filler material and the at least one thermally conductive filler material.

36. (Previously Presented) The method of claim 35, wherein at least one of the siloxane-based compounds comprises a polysiloxane compound.

37. (Previously Presented) The method of claim 35, wherein at least one of the siloxane-based compounds comprises a hydride-functional siloxane compound.

38. (Previously Presented) The method of claim 36, wherein the polysiloxane compound comprises a substituted polysiloxane compound.

39. (Previously Presented) The method of claim 38, wherein the polysiloxane compound is substituted by a functional group comprising an alkyl group, an aromatic group, a halide group or a combination thereof.

40. (Previously Presented) The method of claim 38, wherein the substituted polysiloxane compound comprises an alkenyl-terminated polyalkylsiloxane.

41. (Previously Presented) The method of claim 40, wherein the alkenyl-terminated polyalkylsiloxane comprises a vinyl group.

42. (Previously Presented) The method of claim 41, wherein the alkenyl-terminated polyalkylsiloxane further comprises a methyl group.

43. (Previously Presented) The method of claim 39, wherein the polysiloxane compound comprises vinylmethylcyclotetrasiloxane, polytetradecylmethylsiloxane, polyoctylmethylsiloxane, decylmethylsiloxane, butylated aryloxy- propylmethylsiloxane, octadecylmethylsiloxane, dimethylsiloxane or a combination thereof.

44. (Previously Presented) The method of claim 37, wherein the hydride-functional siloxane comprises methylhydrosiloxane.

45. (Previously Presented) The method of claim 35, wherein the inorganic micro-filler material comprises silicon dioxide.

46. (Previously Presented) The method of claim 35, wherein the inorganic micro-filler material comprises a powder.

47. (Previously Presented) The method of claim 35, wherein the inorganic micro-filler material comprises a flake.

48. (Previously Presented) The method of claim 35, wherein the thermally conductive filler material comprises a transition metal.

49. (Previously Presented) The method of claim 35, wherein the thermally conductive filler material comprises boron.

50. (Previously Presented) The method of claim 48, wherein the transition metal comprises copper.

51. (Previously Presented) The method of claim 49, wherein the thermally conductive filler material comprises boron nitride.

52. (Previously Presented) The method of claim 35, further comprising at least one additive.

53. (Previously Presented) The method of claim 52, wherein the additive comprises a catalyst.

54. (Previously Presented) The method of claim 52, wherein the additive comprises an inhibitor.

55. (Previously Presented) The method of claim 52, wherein the additive comprises a rheological modifier.

56. (Previously Presented) The method of claim 53, wherein the catalyst comprises platinum.

57. (Previously Presented) The method of claim 54, wherein the inhibitor comprises an antioxidant.

58. (Previously Presented) The method of claim 55, wherein the rheological modifier comprises at least one solvent.

59. (Previously Presented) A coating composition produced from the method of claim 35.

60. (Previously Presented) A coating composition produced from the method of claim 52.

61. (Previously Presented) An electronic component comprising the coating solution of claim 59.

62. (Previously Presented) An electronic component comprising the coating solution of claim 60.

63. (Previously Presented) A semiconductor component comprising the coating solution of claim 59.

64. (Previously Presented) A semiconductor component comprising the coating solution of claim 60.

We claim:

1. A thermal interface composition, comprising:

   at least two siloxane-based compounds, wherein each compound has a different solubility parameter,

   at least one inorganic micro-filler material, and

   at least one thermally conductive filler material.

2. The thermal interface composition of claim 1, wherein at least one of the siloxane-based compounds comprises a polysiloxane compound.

3. The thermal interface composition of claim 1, wherein at least one of the siloxane-based compounds comprises a hydride-functional siloxane compound.

4. The thermal interface composition of claim 2, wherein the polysiloxane compound comprises a substituted polysiloxane compound.

5. The thermal interface composition of claim 4, wherein the polysiloxane compound is substituted by a functional group comprising an alkyl group, an aromatic group, a halide group or a combination thereof.

6. The thermal interface composition of claim 4, wherein the substituted polysiloxane compound comprises an alkenyl-terminated polyalkylsiloxane.

7. The thermal interface composition of claim 6, wherein the alkenyl- terminated polyalkylsiloxane comprises a vinyl group.

8. The thermal interface composition of claim 7, wherein the alkenyl- terminated polyalkylsiloxane further comprises a methyl group.

9. The thermal interface composition of claim 5, wherein the polysiloxane compound comprises vinylmethylcyclotetrasiloxane, polytetradecylmethylsiloxane, polyoctylmethylsiloxane, decylmethylsiloxane, butylated aryloxy-propylmethylsiloxane, ctadecylmethylsiloxane, dimethylsiloxane or a combination thereof.

10. The thermal interface composition of claim 3, wherein the hydride-functional siloxane comprises methylhydrosiloxane.

11. The thermal interface composition of claim 1, wherein the inorganic micro-filler material comprises silicon dioxide.

12. The thermal interface composition of claim 1, wherein the inorganic micro-filler material comprises a powder.

13. The thermal interface composition of claim 1, wherein the inorganic micro-filler material comprises a flake.

14. The thermal interface composition of claim 1, wherein the thermally conductive filler material comprises a transition metal.

15. The thermal interface composition of claim 1, wherein the thermally conductive filler material comprises boron.

16. The thermal interface composition of claim 14, wherein the transition metal comprises copper.

17. The thermal interface composition of claim 15, wherein the thermally conductive filler material comprises boron nitride.

18. The thermal interface material of claim 1, further comprising at least one additive.

19. The thermal interface material of claim 18, wherein the additive comprises a catalyst.

20. The thermal interface material of claim 18, wherein the additive comprises an inhibitor.

21. The thermal interface material of claim 18, wherein the additive comprises a rheological modifier.

22. The thermal interface composition of claim 19, wherein the catalyst comprises platinum.

23. The thermal interface composition of claim 20, wherein the inhibitor comprises an antioxidant.

24. The thermal interface composition of claim 21, wherein the rheological modifier comprises at least one solvent.

25. A coating composition comprising the thermal interface composition of claim 1.

26. A coating composition comprising the thermal interface composition of claim 18.

27. An electronic component comprising the thermal interface composition of claim 1.

28. An electronic component comprising the thermal interface composition of claim 18.

29. An electronic component comprising the coating solution of claim 25.

30. An electronic component comprising the coating solution of claim 26.

31. A semiconductor component comprising the thermal interface composition of claim 1.

32. A semiconductor component comprising the thermal interface composition of claim 18.

33. A semiconductor component comprising the coating solution of claim 25.

34. A semiconductor component comprising the coating solution of claim 26.

35. A method of forming a thermal interface material, comprising:

providing at least two siloxane-based compounds, wherein each compound has a different solubility parameter,

providing at least one inorganic micro-filler material,

providing at least one thermally conductive filler material, and

combining the at least two siloxane-based compounds, the at least one inorganic micro-filler material and the at least one thermally conductive filler material.

36. The method of claim 35, wherein at least one of the siloxane-based compounds comprises a polysiloxane compound.

37. The method of claim 35, wherein at least one of the siloxane-based compounds comprises a hydride-functional siloxane compound.

38. The method of claim 36, wherein the polysiloxane compound comprises a substituted polysiloxane compound.

39. The method of claim 38, wherein the polysiloxane compound is substituted by a functional group comprising an alkyl group, an aromatic group, a halide group or a combination thereof.

40. The method of claim 38, wherein the substituted polysiloxane compound comprises an alkenyl-terminated polyalkylsiloxane.

41. The method of claim 40, wherein the alkenyl-terminated polyalkylsiloxane comprises a vinyl group.

42. The method of claim 41, wherein the alkenyl-terminated polyalkylsiloxane further comprises a methyl group.

43. The method of claim 39, wherein the polysiloxane compound comprises vinylmethylcyclotetrasiloxane, polytetradecylmethylsiloxane, polyoctylmethylsiloxane, decylmethylsiloxane, butylated aryloxy-propylmethylsiloxane, octadecylmethylsiloxane, dimethylsiloxane or a combination thereof.

44. The method of claim 37, wherein the hydride-functional siloxane comprises methylhydrosiloxane.

45. The method of claim 35, wherein the inorganic micro-filler material comprises silicon dioxide.

46. The method of claim 35, wherein the inorganic micro-filler material comprises a powder.

47. The method of claim 35, wherein the inorganic micro-filler material comprises a flake.

48. The method of claim 35, wherein the thermally conductive filler material comprises a transition metal.

49. The method of claim 35, wherein the thermally conductive filler material comprises boron.

50. The method of claim 48, wherein the transition metal comprises copper.

51. The method of claim 49, wherein the thermally conductive filler material comprises boron nitride.

52. The method of claim 35, further comprising at least one additive.

53. The method of claim 52, wherein the additive comprises a catalyst.

54. The method of claim 52, wherein the additive comprises an inhibitor.

55. The method of claim 52, wherein the additive comprises a rheological modifier.

56. The method of claim 53, wherein the catalyst comprises platinum.

57. The method of claim 54, wherein the inhibitor comprises an antioxidant.

58. The method of claim 55, wherein the rheological modifier comprises at least one solvent.

59. A coating composition produced from the method of claim 35.

60. A coating composition produced from the method of claim 52.

61. An electronic component comprising the coating solution of claim 59.

62. An electronic component comprising the coating solution of claim 60.

63. A semiconductor component comprising the coating solution of claim 59.

64. A semiconductor component comprising the coating solution of claim 60.

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